

Spiders (Araneae) collected with Berlese-sampler by the Hungarian Soil Zoological Expedition in Ecuador, 1988

By

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Abstract. The Hungarian Academy of Sciences as well as the Department of Systematic Zoology and Ecology of Eötvös University (Budapest) had organized a number of Soil Zoological Expeditions to Ecuador. One of them was directed to Ecuadorian mountain rain forests in 1988. In the course of this expedition several samples were collected. The spiders were obtained by Berlese-sampler and determined by the author. Among 110 specimens of spiders – belonging to 13 families – a lot of juvenile and indeterminable individuals were found. Adult specimens were in 18% present. Depth of determination was kept on family level. Compositions of spider families found in different habitat types (moss, litter, soil and others) are compared. Some interesting Chelicerata are also included in summarizing table.

Sampling sites were located throughout the Ecuadorian mountain forests. Sampling was carried out at 46 sites from different habitats; altogether 100 samples were taken (Table 1) by Dr. A. Zicsi, Dr. Cs. Csuzdi and the Székely family. The material obtained by Berlese-samplers was preserved in metil-alcohol, it was sorted in Hungary and determined by the author in Budapest and Karlsruhe. The spiders are preserved in the collection of Department of Systematic Zoology and Ecology of Eötvös University (Budapest, Hungary) and, in part, in the Staatliches Museum für Naturkunde (Karlsruhe, Germany).

Collecting by Berlese-sampler is generally a good method for the small soil-inhabiting invertebrates. The spiders, however, especially the larger ones which move rapidly, often don't remain in the samples, consequently only the small spiders can be caught with Berlese-sampler. This method seems to be useful for the families Dipluridae, Ochyroceratidae, Caponiidae, Oonopidae, Symphytognathidae, Anapidae and Mysmenidae.

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Results

Altogether 110 spider specimens were found in the studied sites with the Berlese-sampler: 20 adults and subadults (together 18%) and 90 juveniles (82%).

Most of the juvenile spiders were unidentifiable; in these cases only the names „Mygalomorphae” or „Araneomorphae” are used in the table (Table 2). Determination depth of adult and the other older spiders has been kept on family levels. The spiders observed belong to 13 families which are as follows: Scytodidae (4 juv.), Ochyroceratidae (5 juv. + 2 ad.), Segestriidae (1 juv.), Oonopidae (6 juv. + 3 ad.), Theridiidae (5 juv. + 10 ad.), Theridiosomatidae (1 ad.), Linyphiidae (1 ad.), Anyphaenidae (1 juv. + 1 ad.), Zodariidae (1 juv.), Ctenidae (2 juv.), Heteropodidae (1 juv.), Thomisidae (1 ad.), Salticidae (4 juv. + 1 ad.). In addition, 60 juvenile, unidentifiable spiders were detected: 12 mygalomorph and 48 araneomorph spiders.

There were a number of habitats where no spider could be observed; most of the spiders (9 specimens) were found in sample 12, which was moss from branches lying on the ground, above the lagoon San Marcos.

The results of the comparison of different habitat types from the collecting sites are seen in Table 3.

Fig. 1 shows the spider family distribution in the individual habitat types. Most of the spiders came from moss, although the litter was also a relatively rich habitat type for them. Other types of habitats were poorer in spiders. In the soil no adult spiders have been detected, only three juvenile and unidentifiable individuals.

The specimens of the families may occur in different habitat types. Some families (Theridiosomatidae, Linyphiidae, Anyphaenidae, Zodariidae, Ctenidae, Heteropodidae, Thomisidae) were represented only in one habitat type, the others in more than one (Fig. 2). The most interesting species belonged to the families Ochyroceratidae and Oonopidae. These small, tropical spiders were present in moss, litter and in wood debris (see the "other" category), but the majority of both families could be found in litter.

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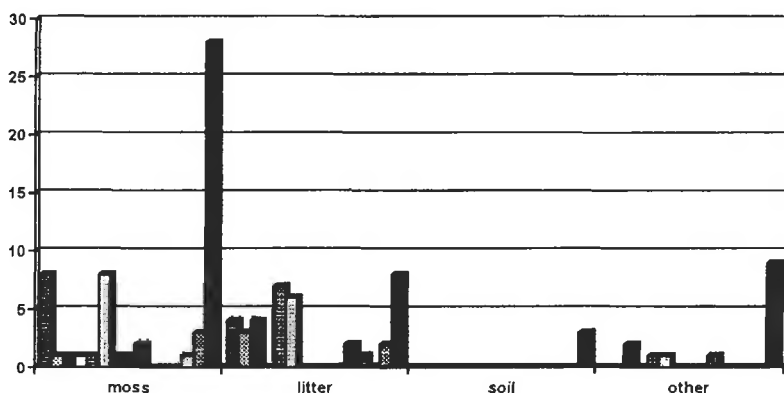
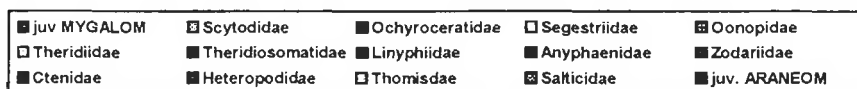


Fig. 1. Distribution of spider families in the habitat types.
(On the vertical axis the number of individuals is indicated)

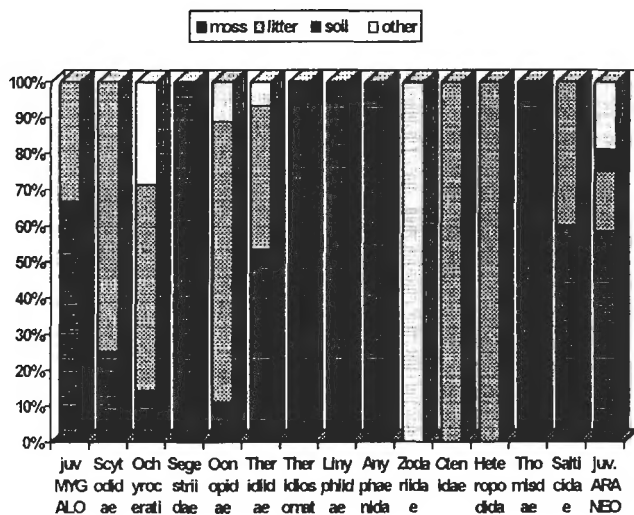


Fig. 2. Percentage distribution of the spider families according to the different habitat types

Table 1. List of the collecting sites in Ecuador

Sam- ples	Date: 1988	Sample type	Habitat and locality
1. 2. 3.	21.04.	moss litter soil	<i>Providencia Pichincha</i> above Quinto, 3200-3400 m a.s.l., 46 km leaving Quinto to Santo Domingo same place same place
4. 5. 6.	21.04.	moss litter soil	close to a rapid, between Quinto and Santo Domingo same place same place
7. 8.	23.04.	grassy level soil	meadow with couch-grass, below Olmedo same place
9. 10. 11.	23.04.	moss grassy level soil	grassy, shrubby vegetation, slope of the volcano Cayambe, 4200 m a.s.l. same place same place
12. 13. 14.	23.04.	moss moss moss-cushion	from branches lying on the ground, above the lagoon San Marcos walls of a road cut, same place slope of the bank, same place
15. 16. 17.	24.04.	moss litter soil	lakeshore (leaving the waterfall), 71 km from Quito to Santo Domingo same place same place
18. 19.	25.04.	moss litter	<i>Providencia Chimborazo</i> Chrunchi, 7 km approaching town same place
20.	25.04.	litter	<i>Providencia Canar</i> below shrubs, 12 km to El Tambo
21. 22. 23.	26.04.	litter grass soil	<i>Providencia Azuay</i> an access road, below shrubs, 26 km leaving Cuenca same place same place
24. 25. 26.	26.04.	<i>Sphagnum</i> litter soil	plateau, 4000 m a.s.l., 52 km from Cuenca, on the road to Loja same place same place
27. 28. 29.	26.04.	moss litter soil	<i>Providencia Loja</i> leaving Saraguro, 175 km from Cuenca same place same place
30.	27.04.	mixed litter, soil and grass	5 km leaving Loja, towards Vilcabama
31. 32. 33.	27.04.	moss litter soil	12 km leaving Loja, on the way to Vilcabama same place same place
34.	28.04.	litter	valley of a creek, 6 km leaving Yangana to Zumba
35. 36.	01.05.	litter tussocks	dry, shrubby area, 35 km leaving Loja, on the way to Machala same place
37. 38. 39.	01.05.	moss litter soil	at the bridge, 85 km from Loja, leaving Zambí same place same place
40. 41.	02.05.	litter bromelias	<i>Providencia El Oro</i> patch of primary forest, 11 km from Santa Rosa, to Loja same place
42. 43.	02.05.	tussocks, tuff succulent	leaving Pasaje, 54 km from Santa Rosa same place
44. 45.	02.05.	tussocks soil	dry area, leaving Pasaje, 64 km from Santa Rosa same place
46. 47. 48.	02.05.	moss litter soil	mountain slope, 15 km leaving Santa Isabel same place same place
49. 50. 51.	02.05.	litter grass soil	<i>Providencia Azuay</i> between Giron and Victoria de el Portete same place same place

Table 1. (Continued)

Sam- ples	Date 1988	Sample type	Habitat and locality
52.	03.05.	moss	leaving Chordeleg, 39 km from Cuenca
53.		litter	same place
54.	03.05.	moss	slope of bank, 2 km leaving Sigsig
55.		litter	same place
56.	04.05.	moss	<i>Providencia Canar</i>
57.		litter	between El Tambo and Zhud, 84 km from Cuenca
58.		soil	same place
59.	30.04.	soil	<i>Providencia Loja</i>
60.	04.05.	soil, lower lay.	52 km from Loja, on the way to Cuenca
61.		soil, upper lay	<i>Providencia Tungurahua</i>
62.	06.05.	moss	leaving Riobamba, near Mocha Pata
63.	07.05.	bromelias	same place
64.	09.05.	moss	<i>Providencia Pichincha</i>
65.		litter	from trees, on the slopes of the volcano Cayabe, above the lagoon San Marcos
66.		tussocks	79 km from Quinto, leaving the church, at an Indian dwelling
67.		wood debris	<i>Providencia Napo</i>
68.		bromelias	from trees, cut primary forest patch, leaving Borja, to Lago Agrio
69.		soil	same place
70.	09.05.	moss-cushion	same place
71.		litter	hillside, on the way to Lago Agrio, 3 km leaving Las Palmas
72.	09.05.	moss	same place
73.	10.05.	moss	near the bridge of Rio Marker, on the way to Lago Agrio
74.		litter	primary forest patch, leaving San Vicente
75.		soil	same place
76.	10.05.	litter	same place
77.		wood debris	patch of primary forest, leaving Lago Agrio, 8 km towards Dureno
78.	10.05.	litter	cut forest patch on the same place
79.		litter	of coffee plantation, 25 km leaving Lago Agrio
80.		moss	nearby primary forest patch, same place
81.	10.05.	litter	same place
82.	10.05.	litter	primary forest patch on the riverside of Rio Aguarico, leaving Dureno
83.	10.05.	litter	primary forest patch at the second bridge, leaving Dureno
84.	11.05.	moss	primary forest patch, 2.5 km on accede road, to Ago Agrio
85.		litter	primary forest cut, 48 km leaving Lago Agrio, towards Quinto
86.		wood debris	same place
87.	11.05.		same place
88.	11.05.	moss	primary forest patch, between Lago Agrio and Quinto, 70 km from Lago Agrio
89.		litter	primary forest between Lago Agrio and Quinto, 80 km from Lago Agrio
90.	11.05.	bromelias	same place
91.	11.05.	moss	cut primary forest, 1 km leaving Reventador
92.		litter	meadow, above Papallacta, in about a distance of 7 km
93.		soil	same place
94.	11.05.	litter	same place
95.	11.05.	moss	of a pachonal, about 9 km above Papallacta
96.	13.05.	moss	near the summit, between Papallacta and Pifo
97.		litter	<i>Providencia Pichincha</i>
98.	13.05.	soil	leaving El Chaupi, on the way to El Refugio finca
99.		chusion-pl.	same place
100.		moss	paramo vegetation, above El Chaupi on the slope of Iliniza
			same place
			from the ground, higher on the slope of Iliniza, on 4400 m a.s.l., 2 km further

Table 2. (Continued)

Samples	Ordo or subordo	Spider family	Male	Female	Total			Total Spiders/ coll. site	Other Chelic.
					Juv.	Adult	Spiders /Shabit.		
40	ARANEOMORPHAE	Theridiidae		1		1	1		-
41.					1		1	2	-
42.							-		-
43.	ARANEOMORPHAE						-	-	-
44.					2		2		-
45.							-	2	-
46.		Scytodidae			2		2		-
47.							-	2	-
48.							-		-
49.	OPILIONIDEA ARANEOMORPHAE				1				1
50.		Scytodidae			1		2		-
51.		Ochyroceratidae			1		1	3	-
52.	MYGALOMORPHAE						-		-
53.		Heteropodidae			1				-
54.		Salticidae			1		3	3	-
55.	MYGALOMORPHAE				6		6		-
56.		Ctenidae			1		1	7	-
57.		Salticidae			1		1		-
58.							-	1	-
59.							-	-	-
60.							-	-	-
61.		Theridiidae		1		1	1	1	-
62.							-	-	-
63.							-		-
64.							-		-
65.							-		-
66.							-		-
67.		Ochyroceratidae	1			1	1		-
68.		Theridiidae		1		1	1		-
69.							-	2	-
70.	ARANEOMORPHAE MYGALOMORPHAE OPILIONIDEA	Salticidae			5 1 1				- - -
71.		Theridiidae	1			1	8		1
72.					1		1	9	-
73.		Anyphaenidae		1	1				-
74.		Thomisidae				1			-
75.		Linyphiidae	1			1	3	3	-
76.		Ochyroceratidae			1		1		-
77.							-	1	-
78.							-		-
79.	OPILIONIDEA SCHIZOMIDA	Theridiidae			1				-
80.		Oonopidae		1		1	1		-
81.					1		1	2	-
82.	ARANEOMORPHAE				2		2	2	-
83.							-	-	-
84.		Theridiidae	s1			s1	1	1	-

Table 2. (Continued)

Samples	Ordo or subordo	Spider family	Male	Female	Total			Total	Other Chelic.
					Juv.	Adult	Spiders/habit.	Spiders/coll.site	
84.		Theridiidae		1		1	1		-
85.							-		-
86.		Oonopidae	s1			s1	1	2	-
87.		Zodariidae			1		1	1	-
88.	OPILIONIDEA				1				7
	MYGALOMORPHAE								-
		Salticidae	s1			s1	2		-
89.							-	2	-
90.							-	-	-
91.		Theridiidae		1		1			-
		Theridiosoma-tidae	s1			s1			-
							2		-
92.	ARANEOMORPHAE				1				-
		Salticidae			1				-
		Theridiidae	s1			s1	3		-
93.	ARANEOMORPHAE				1		1	6	-
94.	ARANEOMORPHAE				1		1	1	-
95.							-	-	-
96.	ARANEOMORPHAE				2		2		-
97.	OPILIONIDEA								1
	ARANEOMORPHAE				1				-
		Theridiidae		1		1	2	4	-
98.							-		-
99.							-	-	-
100.							-		-
								110	23

Table 3. Summ-up of spider individuals in similar habitats from different collecting sites

Spider families	Moss	Litter	Soil	Other	Total
juv. MYGALOM.	8	4			12
Scytodidae	1	3			4
Ochyroceratidae	1	4		2	7
Segestriidae	1				1
Oonopidae	1	7		1	9
Theridiidae	8	6		1	15
Theridiosomatidae	1				1
Linyphiidae	1				1
Anyphaenidae	2				2
Zodariidae				1	1
Ctenidae		2			2
Heteropodidae		1			1
Thomisidae	1				1
Salticidae	3	2			5
juv. ARANEOM.	28	8	3	9	48
Σ spider individ/ habitat type	56	37	3	14	Σ110
Σ spider families/ habitat type	10	7	-	4	Σ13

Average number of spiders/ habitat type	(56/28)	(37/32)	(3/21)	(15/11)
	2,00	1,15	0,14	1,36

REFERENCES

1. BRIGNOLI, P. M. (1983): A catalogue of the Araneae described between 1950 and 1981. – Manchester.
2. EMERTON, J. H. (1961): The common spiders of the United States. – New York.
3. GESCHMAN DE PICELN, B. S. & SCHPIAPELLI, R. D. (1963): Llave para la determinacin de faómilas de Aranas Argentinas. – Buenos Aires.
4. HÖFER, H. & BRESOVIT, A. D. (1996): On the genus *Xyccarph* in central Amazonia (Araneae: Oonopidae). – Bull. Br. Arachnol. Soc., 10 (4): 149–155.
5. NETWIG, W. (1993): Key to the families and to most genera of Panamanian spiders. – Flora & Fauna Handbook, 12. – Panama.
6. PÉREZ-MILES, F., LUCAS, S. M., DA SILVA JR., P. I. & BERTANI, R. (1996): Systematic revision and cladistic analysis of Theraphosinac (Araneae: Theraphosidae). – Mygalomorph, 1: 33–68.
7. PLATNICK, N. I. (1989): Advances in spider taxonomy 1981–1987. – A supplement to Brignolis: A catalogue of the Araneae described between 1940 and 1981. Manchester.
8. PLATNICK, N. I. (1993): Advances in spider taxonomy 1988–1991. – New York.
9. ROEWER, C. FR. (1952): Katalog der Araneae von 1758 bis 1940. Band 1. – Bruxelles.
10. ROEWER, C. FR. (1954): Katalog der Araneae von 1758 bis 1940. Band 2. – Bruxelles.